Announcements

- Read Chapter 7.1 for next time
- Assignment 7 is extended, due Tuesday April 5!

What we will do today

- Problem Solving – Chapter 6
- Practice writing methods and functions
- Talk about assignment 7

Problem To Solve

- Given three animals standing in a row
- Resize each of them randomly by 1 (no change) to 4 times its size
- Whichever is taller, spin around once to the right, once to the left
- Sort the animals by their height
- Display message “In order” whenever in order by increasing height
Objects in the world

- Animals – chicken, rabbit, and penquin
- Balls (will be invisible always)
  - tennisball1 – represent position 1
  - tennisball2 – represent position 2
  - tennisball3 – represent position 3
- 3D text – “In order!
  - Invisible until animals in order by height

Random Integers

- Bug in Alice with “integers only” and how they are used…..

RandomIntegers

```
world.randomIntegerToMax
world.randomIntegerToMax [1..] maximum
originalNum - 1

// precondition: Max is an integer greater than 1
// returns a random integer from 1 to Max

randomNum - set value to random number minimum - 0 maximum - maximum integerOnly - true
```

Return ?

world. my first method

```
world.myFirstMethod No parameters

No variables
```

makeTallerAnimalSpinAround

- Need to know which of the three animals is taller

makeTallerAnimalSpinAround

```
world.isTaller3
world.isTaller3 [animal1, animal2, animal3]

No variables
```

returns true if animal1 is taller than animal2 and animal3, otherwise returns false
makeTallerAnimalSpinAround
• Use isTaller3

Another way – whichIsTaller3?

How do we use whichIsTaller3?
• How do we turn the taller of the three around once to the left?

How do we check if items are sorted by increasing height?
• Check if object in position 1 is shorter than object in position 2 which is shorter than object in position 3
• How do we know which animal is in a position?
isSortedByIncreasingHeight

- Use isSortedByIncreasingHeight

whichObjectIsClosestTo

- Use whichObjectIsClosestTo

CheckIfSortedByHeight

- Use isSortedByIncreasingHeight
- Use whichObjectIsClosestTo

SortAnimalsByHeight

- How? Lots of answers
One way – moveAnimalsToSortedPositionIfAnimal1IsTallest

- 3 parameters – anim1, anim2, anim3
- If anim1 is the tallest, then compare other 2 and move each to corresponding tennisball
- If anim1 is not the tallest, don’t do anything

SortAnimalsByHeight

- Demo

Problem is Solved!
Assignment 7 - Gatekeeper

- Demo
- Useful things to do
  - When S is typed – show answer
  - Display tennis balls til program is working
  - Randomly set gatekeeper – game different each time played

Assignment 7 – Gatekeeper Useful functions

- World.SwapPlayers (obj player)
  – Swap player with player furthest away
- World.whichObjectNearBall (obj ball)
  – Return object closest to ball
- World.NearWhichBall (obj player)
  – Returns ball that player is closest to
- World.whichObjectIsGateKeeper
  – Returns object that is gatekeeper

Assignment 7 – Binary Code Game

- Demo
- Useful info
  - When S is typed show answer
  - Randomly set answer
  - How do you tell if lever is up or down?
    • Use invisible sphere – two colors
    • Don’t compare sphere’s position with lever – bug in Alice so this doesn’t work

Assignment 7 – BCG Useful Functions

- changeSphereColor (obj sphere)
  – changes color of sphere to other color
- switchFlip (obj switch)
  – Change lever position (and sphere color)
  – Check if valid code and if so, indicate
- isValidCode
  – Return true if code is valid
- isSwitchUp (obj switch)
  – Returns true is lever is up
- whichSphereIsClosest (obj switch)
  – Returns sphere that is closes to switch